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Mitigating Prescription Opioid Risk: Prescription Drug Monitoring Programs

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Abstract

Background: Opioid-related morbidity and mortality is a serious public health issue in the United States. Prescription Drug Monitoring Program (PDMP) review prior to prescribing opioids has consistently been recommended as best practices for risk mitigation, however, access/utilization of this monitoring program remains low.

Methods: This quality improvement (QI) project for improved PDMP utilization employed a pre-post survey design in a random sample of Advanced Practice Registered Nurses in Arizona. Quantitative measures included online surveys with close-ended responses to salient items from the review of literature and best practices. A follow-up survey was requested of the participants who provided their email address one month following initial survey/best practice review.

Results: Forty-six APRNs responded to the preliminary survey. Of the initial respondents, 22 completed the post-intervention survey one month after the QI activity. APRNs reported improved compliance with best practice recommendations including initial PDMP review prior to prescribing opioid medication for non-cancer, non-terminal pain, reviewing morphine milligram equivalents (MMEs) of prior prescriptions, < 3 month PDMP review for patients receiving chronic opioid medication, APRN addressing concerning PDMP review results, and maintaining an opioid dosage < 50 MMEs.

Conclusions: Targeted educational awareness for APRNs can improve utilization of PDMPs and support increased adherence to safe, opioid prescribing best practices.

Keywords: Opioid prescribing, prescription drug monitoring programs

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Introduction

In the next hour, eight Americans will die from an opioid overdose. Of that number, four will be from prescription opioids (Centers for Disease Control and Prevention [CDC], 2017). Prescription opioid deaths are preventable. One method of risk mitigation involves utilizing Prescription Drug Monitoring Programs (PDMPs). PDMPs gather, observe, and analyze electronically transmitted, patient-specific, controlled substances data submitted by pharmacies and dispensing practitioners. Reviewing the PDMP has consistently been recommended as best practice for reducing prescription opioid morbidity and mortality risk (Chou et al., 2014; Dowell, Haegerich, & Chou, 2016). However, utilization rates remain low. For example, findings reveal only 22% of Arizona prescribers were registered with the Arizona Controlled Substances Prescription Monitoring Program (AZCSPMP) (Dodge, 2017). Actual utilization is likely even lower. Failure to check the PDMP can result in the patient receiving a lethal medication combination.

Background

The United States (U.S.) accounts for approximately 5% of the world's population but consumes 80% of the global opioid supply (International Narcotics Control Board, 2009). Opioid prescriptions in the U.S. have increased since 1999 with a concurrent increase in opiate-related deaths (CDC, 2011; Hedegaard, Warner, & Miniño, 2017) and are responsible for almost half of overdose deaths (Rudd, Seth, David, & Scholl, 2016). Annual U.S. overdose deaths now surpass the number from auto accidents (U.S. Department of Health & Human Services [DHHS], 2015).

Significant historical events contributed to opioid pain reliever (OPR) popularity. Pharmaceutical company, Purdue Pharma, released OxyContin to the market in 1995. An aggressive marketing campaign included financial grants encouraging the use of OPRs in chronic, non-cancer pain. The American Pain Society began the "pain is the fifth vital sign" campaign which the Joint Commission also adopted. Pain was given the same clinical significance as objective findings such as temperature, pulse, respiration rate, and blood pressure. Despite lack of evidence for long-term efficacy, OPR prescriptions continue to rise (Hedegaard, et al., 2017; Kolodny et al., 2015).

In response to the surge in opioid-related morbidity and mortality, the CDC (2017) issued a state-wide "call to action." Accordingly, on June 5th, 2017, Arizona Governor Douglas Ducey declared a public health emergency (State of Arizona, 2016) and created a task force to address this epidemic (Arizona Department of Health Services [ADHS], 2017a). The ensuing *Opioid Overdose Epidemic Response Report* provided recommendations consistent with best practice guidelines (ADHS, 2017b), including a mandate requiring that prior to prescribing a Schedule II, III or IV opioid analgesic or benzodiazepine, a provider must acquire a PDMP patient utilization report for the preceding 12 months (Amending Sections 36-2606 and 36-2608, 2016).

The CDC has provided twelve recommendations for long-term prescription opioid use in adults ages 18 and older with chronic, non-cancer, non-terminal pain. These include three main categories. One category is targeted at assessing risk and addressing opioid use harms (Dowell, et al., 2016). Risk mitigation strategies correspond with the Institute of Medicine [IOM] (2001) dimensions of quality, specifically safe and effective care. Improved safety is reflected by decreased morbidity and mortality from an adverse event or harm. Several studies have supported introduction of a state PDMP and reductions in strength and/or quantity of opioid

prescriptions (Bao et al., 2016; Deyo et al., 2018; Wen, Schackman, Aden, & Bao, 2017; Yarbrough, 2017) as well as a reduction in opioid-related deaths (Patrick, Fry, Jones, & Buntin, 2016) and opioid abuse (Reifler et al., 2012). National and local publicity highlighting the opioid crisis is a "hot button" topic reinforcing best practice implementation. While providers are invested in safe care, barriers to best practice implementation exist. Provider practice varies, with some providers monitoring the PDMP while others do not.

Problem Statement

The risk of overdose/death among Arizona adults 18 years of age and older prescribed long-term opioids for non-cancer, non-terminal pain is indicated by morbidity and mortality statistics and results from deficits in risk identification including prescriber utilization of the state PDMP. A Quality Improvement (QI) project which promotes improvement of AZCSPMP utilization is suggested.

Organizational "Gap" Analysis of Project Site

The Agency for Health Care Research and Quality (AHRQ) supports quality and safety as it relates to prescribing long-term opioids for chronic pain (Chou et al., 2014). The gap relates to the Arizona state mandate requiring providers check the AZCSPMP prior to prescribing controlled substances and at minimum specific intervals thereafter. Despite legislative mandate, prescriber registration and utilization are low.

Review of the Literature

A database search of PubMed and The Cumulative Index to Nursing and Allied Health Literature (CINAHL) was performed for articles dated January 1, 2013 to present. Medical Subject Headings (MeSH) terms searched in both databases were *prescription drug monitoring programs AND utilization* and *prescription drug monitoring program*s *AND barriers.* One

hundred fifty-one articles were retrieved from the search, including 91 articles from PubMed and 60 from CINAHL. The database search on PDMPs and utilization yielded 66 articles from PubMed and 44 from CINAHL. PDMPs and barriers generated 25 and 16 articles from PubMed and CINAHL, respectively. Publications were reviewed for inclusion. Of the articles on PDMPs and utilization, 50 were excluded from the PubMed results and 36 from CINAHL. Twelve articles were excluded from the PubMed results and nine from the CINAHL search on PDMPS and barriers. Inclusion criteria for the review was full-text, peer-reviewed, English language articles. Excluded articles were four editorials, four best practices/guidelines, 11 focusing on pharmacists, 49 specific to patient level date, nine relating to PDMP policy, and five educational articles. Additional excluded articles consisted of one case study, 15 irrelevant articles, two poor quality studies, and 16 policy reviews. Also, one article written in Spanish and three articles which were not peer-reviewed were omitted. Poor quality studies lacked adequate sample size, response rate, and/or were poorly designed. Irrelevant articles either focused on an unrelated topic or opioid dispensing. Lastly, 27 duplicate articles were excluded. Review of article reference lists identified two additional articles for inclusion. Six articles remained for review and synthesis.

The six selected studies on PDMPs and opioid prescribing practices included one retrospective cohort study, one systematic review of case-control studies, one cross-sectional random sample survey, two cross-sectional non-randomized surveys, and one qualitative interview study. The strength of recommendations and quality of the evidence was evaluated utilizing The Johns Hopkins Nursing Evidence-based Practice Rating Scale. Based upon scientific study design, strength of evidence is rated from a high of Level I to a low of Level V.

The quality of evidence represents the level of expertise evident and is rated high, medium, or low (Newhouse, Dearholt, Poe, Pugh, & White, 2005).

PDMP Utilization

PDMP utilization varies. A frequent theme found prescribers rely heavily on their subjective impression of a patient when determining if PDMP review is indicated (Leichtling et al., 2016; Lin et al., 2018; Smith et al., 2015; Young et al., 2017). Leichtling et al., (2017) evaluated a purposive sample of PDMP utilization. Short-term prescribers i.e., those working in acute care facilities, reported inconsistent use of the PDMP. Long-term prescribers, were more likely to check the PDMP for new patients and at spaced intervals for long-term patients. Strength of evidence: Level III, Quality Level medium (Newhouse, et al., 2005). However, physicians working in a managed care organization were less likely to utilize PDMP (Lin et al., 2018). Strength of evidence: Level III, Quality Level medium (Newhouse et al., 2005). Pomerleau et al. (2016) found a mere 8% (n = 18) of surveyed emergency department (ED) prescribers check the PDMP with each patient. Strength of evidence: Level III, Quality Level medium (Newhouse et al., 2005).

PDMP use was evaluated in a survey of physicians practicing in primary care, pain medicine and emergency medicine (Lin et al., 2017). Participants utilizing the PDMP reported it was very easy (33%, n = 82) or somewhat easy (47%, n = 114) to use. Strength of evidence: Level II, Quality Level medium (Newhouse et al., 2005). Other studies suggest significant barriers.

PDMP Barriers

Provider perception and satisfaction with the PDMP can affect utilization. PDMP utilization and perception was evaluated by Young, Tyndall, and Cottler (2017). Survey results

suggested barriers including difficulties in initial access, frequent password renewal, and timing out requiring re-entry of username/password. Strength of evidence: Level III, Quality Level low (Newhouse et al., 2005). Lin et al. (2017) also found 20% of respondents reported access issues. Similarly, Smith et al. (2015) found barriers including lack of awareness as well as access and time constraints. Strength of evidence: Level III, Quality Level medium (Newhouse et al., 2005). A survey of 515 emergency department (ED) providers revealed only 59% of respondents was registered with their PDMP. Fifty-three percent reported consulting the PDMP at least once a shift. Sixty-three percent reported being satisfied (47%) or very satisfied (16%) with the state PDMP (Pomerleau et al., 2016).

Several limitations are noted. Self-report and retrospective information can impact reliability and validity of findings. The lack of randomized clinical trials reduces data quality. Additionally, use of local/state-specific and non-randomized samples limit generalizability of data (Gravetter & Forzano, 2016).

Utilization of the PDMP varies; lack of sanctions for non-compliance with state PDMP requirements may play a role in the findings. Subjective impression as criteria for PDMP utilization was supported by four studies (Leichtling et al., 2016; Lin et al., 2018; Smith et al., 2015; Young et al., 2017). While some individuals with substance use disorders have some similar physical characteristics, not all individuals look the same. Objective data is necessary to reduce the risk of targeting certain individuals and missing serious substance abuse in others. Lack of standardized state PDMP guidelines and enforcement of state mandates may limit data utility. Despite governmental mandates, there is no standardized use of the PDMP. Information on ease of access is conflicting. Some prescribers report logistical interference. This could reflect user skill, time constraints, or individual provider decision.

Provider compliance with risk mitigation strategies supports best practices and IOM (2001) quality domains. A QI project to support/improve PDMP utilization and PDMP access was indicated. The goal was decreased morbidity and mortality by reducing high-risk opioid prescribing for patients with non-terminal, non-cancer pain.

Evidence Based Practice: Verification of Chosen Option

Reviewing the PDMP is recommended as best practice when prescribing long-term opioids (Chou et al., 2014; Dowell, et al., 2016). Risk assessment and mitigation strategies, including reviewing the PDMP, are recommended to reduce the risk of unintentional overdose/death. Providers may alter their treatment plan after reviewing information from the PDMP by reducing the quantity, strength, or duration of opioids prescribed.

Theoretical Framework/Evidence Based Practice Model

Fishbein and Ajzen's (2010) Theory of Reasoned Action and Planned Behavior (most recently referred to as The Reasoned Action Approach) (Appendix A) is a theoretical framework developed to explore ways of predicting behaviors and outcomes. They propose attitudes and perceived "norms" have an effect on behavior, that behavior is a function of behavioral intentions and perceived behavioral control (Fishbein & Ajzen, 2010). For example, emergent governmental interventions and recent policy changes may be associated with an attitude change about opioid prescribing "norms." Clinicians' attitude toward the mandate and utility of the program affect use. If prescribers perceive checking the PDMP as the new "norm," there is increased probability providers will change their perspective on prescribing long-term opioids. The outcome measure was the behavior, in this case, PDMP review.

Goals, Objectives and Expected Outcomes

Goals for the Capstone project included identifying facilitators and barriers of PDMP utilization and increasing APRN knowledge about PDMP utilization when prescribing long-term opioids for chronic pain.

The objectives for this DNP project were to evaluate facilitating factors and barriers to utilization of the AZCSPMP and provide an online video review for PDMP best practices when prescribing opioid medication for non-cancer, non-terminal pain.

The main outcome was improved utilization of the Arizona PDMP. Utilization was defined as initial PDMP review prior to prescribing opioid medication for non-cancer, non-terminal pain, reviewing morphine milligram equivalents (MMEs) of prior prescriptions, <3-month PDMP review for patients receiving chronic opioid medication, APRN addressing concerning PDMP review results, and maintaining an opioid dosage < 50 MMEs. It was anticipated that a QI video reviewing best practices would result in improved utilization of the AZCSPMP.

The target for the outcome indicators was 30 percent compliance for all at baseline and 60 percent at one month post initial survey/QI activity. The target benchmark, an external benchmark, was set relative to the current state PDMP utilization rates for all prescribing providers prior to the surveys and QI presentation.

Methods

The proposed QI project utilized a random sample of Arizona advanced practice registered nurses (APRNs). The sampling frame was entered into the Excel sheet. Randomization occurred using the "= RANDBETWEEN()" function. A pre-/post-survey design was utilized. Quantitative measures included online surveys with close-ended responses to

salient items from the review of literature and best practices. The QI intervention, a risk mitigation video reviewing evidence-based practices for prescribing opioids, as well as requirements of the Arizona mandate, was presented to APRNs immediately following participants' completion of the preliminary survey. A follow-up survey was requested of the participants who provided their email address one month after initial survey/best practice review.

Project Site

An Arizona behavioral health organization provided clinical support for the Capstone QI project. The business has a 31-year history of providing comprehensive, medically-integrated behavioral health programs. They provide substance abuse treatment including detoxification, residential, and medication-assisted treatment. Additionally, the organization provides integrated care treatment for co-morbid medical conditions including prevention, education, and treatment services using nationally recognized treatment models. Services are provided at multiple sites throughout Arizona.

The DNP student, as project director, provided a summary of findings to administrative members at project competition. This will assist administration with future QI initiatives for provider prescribing. The findings will be particularly salient for ongoing QI efforts on safe prescribing practices including treatment of anxiety and substance use disorders as well as integrated health care.

The project took place via online survey. Required resources included APRN addresses, mailing materials, online survey site, online QI activity, and follow-up capacity. The main barrier was the means available for contacting APRNs licensed to practice in Arizona. By policy, the Arizona Board of Nursing will only release mailing addresses of licensed nurses, not email addresses (Arizona State Board of Nursing, 2018). The project director requested the

mailing list. Email communication with Kathy Malloch, PhD, MBA, RN, FAAN, Associate Director/Education and Evidence Based Regulation at Arizona State Board of Nursing confirmed approved use of the requested APRN list for the QI project (Appendix B). The acquired list included the names of 8817 APRNs with active Arizona licenses. The cost of mailing to all Arizona APRNs was cost prohibitive, therefore a random sample of 1700 was selected. Other potential resources for email addresses included the Arizona Board of Pharmacy who manages the AZCSPMP and the American Academy of Nurse Practitioners. The DNP student sent email communications to these two potential sources inquiring on the availability of an email list of APRNs without success.

Population

Inclusion criteria were APRNs with active Drug Enforcement Administration (DEA) certificates and prescribing privileges within the state of Arizona completing pre- and post-survey and QI activity. Additional inclusion criteria consisted of APRNs who prescribe opioids for non-cancer, non-terminal pain in the state of Arizona from August 2018 through February 2019. Individuals falling outside of the above noted criteria were excluded.

The DNP student, as project director, was responsible for all phases of project development, implementation, data collection, data analysis, and evaluation. The implementation plan/procedures contained the following steps: proposal write-up and approval, obtaining mailing list of APRNs practicing in Arizona, creating and ordering postcards, mailing postcards/email requesting participation. A copy of the postcard content is included in Appendix C. The next steps were developing an online survey by adapting a previously developed PDMP survey, posting the survey on Survey Monkey, creating and including a link to the QI activity at the end of the first survey, followed by requesting participants complete a follow-up survey one

month after QI activity. The last steps included collecting, cleaning, and analyzing the data and final write-up.

The goal sample size was determined utilizing an online calculator at SurveyMonkey. The total population size was 8819. With a standard confidence interval of .80 and a margin of error of 0.05, a sample of at least 161 was required. The anticipated response rate for an external mail survey is 10% (Gravetter & Forzano, 2016). To obtain the minimum sample size, at least 1610 invitations needed to be mailed; however, 1700 was the number of invitations mailed.

Measurement Instruments

The outcome variable was PDMP utilization via best practice behaviors and requirements of the Arizona mandate. Coinciding with the theoretical framework, it was posited that attitude, outcome expectancies, perceived norms, perceived barriers/control factors, and behavior intention would influence PDMP utilization. Proposed mediating factors were attitude of PDMP usefulness, beliefs concerning prescription drug abuse, beliefs regarding peers' utilization of the PDMP, perceived social and professional norms, perceived ethical obligation to use the AZCSPMP, and perceived confidence with or barriers to use of the PDMP. Demographic and practice data were obtained from the survey. A letter requesting permission to use the 23-item survey created by Pugliese, Wintemute, and Henry (2018) was mailed to the lead author (Appendix D). Email communication with the lead study author granting permission was received and is included in Appendix E. The DNP student created adapted versions of the survey which included items on risk mitigation strategies/best practices and additional items reflecting normative behaviors of best practices/risk mitigation. The adapted pre-and post-intervention surveys are presented in Appendices F and G. The project included a 35-question pre-intervention survey, a best practice review video, and a 27-question post-survey.

Data Collection Procedures

Data collection for the project entailed several steps. A preliminary survey was made available on SurveyMonkey. Presentation of PDMP utilization best practices to APRNs occurred as a web link at the end of the first survey. The post-survey was administered to participants one month after the initial survey/online QI video presentation by the DNP project director. A follow-up email address was requested in the initial survey to allow for follow-up communication. Data cleaning and analysis followed.

Ethical Considerations/Protection of Human Subjects

The University of Massachusetts, Amherst (UMASS) IRB approval was obtained prior to initiating the DNP project and was completed in accordance with UMASS Amherst guidelines (Moran, Burson, & Conrad, 2014). The official IRB Determination Form was submitted after the proposal was approved. Care, in accordance with best practices was expected to improve, therefore risk was minimized, and benefit was anticipated. In order to protect the confidentiality of human subjects in the QI project, research and IRB review procedure complied with 45 C.F.R. § 46 (Protection of Human Subjects, 2009). Safeguards were utilized to assure favorable risk-benefit ratio, respect for participants, informed consent, and independent review. The proposal involved pre-/post-survey with a QI activity for APRNs. No patient data was collected.

Respect for participants included protecting individually identifiable data elements, following recommended procedures for data storage and linking for information retrieval. The DNP project director had sole access to this information which was in a double-locked location. Protected health information (PHI) was not utilized for any part of the project.

Participant information for this project included: name, city/town, and state which was only utilized for the initial mailing. Race/ethnicity, clinical specialty, and email address were the

only participant information collected for the preliminary and post-intervention surveys. This method assured participants' anonymity was maintained. Upon project completion, data was destroyed according to the institutional requirements (Moran, et al., 2014). The Arizona Board of Nursing and the clinical site expressed support for the QI project and did not require IRB approval.

Results

Forty-six APRNs (n = 46) responded to the preliminary survey containing quantitative questions. The pre-intervention survey included two preliminary inclusion questions on possession of Arizona prescriptive privileges and Federal DEA certificate. One survey was excluded for lack of a DEA certificate, as that individual could not prescribe Schedule II opioids. Of the remaining 45 respondents, 22 completed the post-intervention survey. Paired data was available on 8 participants. The timeline for the project spanned from September 2018-April 2019.

Data Analysis

Analyses were performed on aggregate, quantitative data. An Excel sheet of survey responses was retained, compiled, and analyzed. Data was scored using IBM's Statistical Package for the Social Sciences (SPSS Statistics for Windows, Version 22.0). Data analysis was accomplished with basic descriptive statistics (frequencies and means/medians) for the structured-response items as well as demographic data. Relationships between survey items were analyzed with the nonparametric Spearman's rank-order correlation. This methodology was utilized due to the dependent variable being measured on an ordinal level as well as being highly skewed (Polit, 2010).

Independent variables included demographic data as well as questions reflecting concepts from Fishbein and Ajzen's (2010) Theory of Reasoned Action and Planned Behavior. Theoretical framework concepts included categories of normative beliefs, attitude, outcome expectancies, and behavior intention.

Dependent variables were operationalized utilizing five questions specific to opioid prescribing best practices. Responses were at the ordinal level of measurement on five and six-point Likert scales. Responses to the five questions reflecting best practices were transformed to dichotomous responses. These five variables were recoded to dummy variables for data analysis with values of 0 (no) and 1 (yes). Only one potential response from each question was coded affirmatively, reflecting responses *every day* and *always.* Results of self-reported best practice behaviors are presented in Table 1.

Table 1

Self-reported Best Practice Behaviors

Behavior	Preliminary Survey (n = 45) % (n)	Post-intervention Survey (n = 22) % (n)
Check initial 12-month PDMP report prior to prescribing opioids.	11.1% (5)	31.8% (7)
Review morphine milligram equivalents (MMEs) or prior prescriptions.	11.1% (5)	36.4% (8)
Check the CSPMP ≥ every 3 months for patients receiving opioids.	51.1% (23)	59.1% (13)
Document concerning PDMP results.	57.8% (26)	63.6% (14)
Maintain an opioid dosage < 50 MMEs per day.	37.8% (17)	50.0% (11)

Findings suggest increased adherence to best practices across all five recommendations after online video review. APRNs reported 57.8% compliance with addressing concerning PDMP review results in the preliminary survey. This increased to 63.6% post-best practice review, exceeding the 60% target set, and resulted in the objective for that indicator being met. Targets for the four other indicators were not met. In the preliminary survey, 11.1% reported initial PDMP review prior to prescribing opioid medication for non-cancer, non-terminal pain while 31.8% of the post-intervention group reported completing the review. Reviewing MMEs of prior prescriptions was reported in 11.1% and 36.4% pre- and post-intervention, respectively. Pre-intervention, 51.1% reported <3-month PDMP review for patients receiving opioids, while 59.1% reported post-intervention adherence. Lastly, maintaining an opioid dosage < 50 MMEs increased to 50.0% post-implementation from 37.8% reported at baseline.

Demographic information presented in Table 2 was obtained for the preliminary survey sample (n = 45). The sample was 88.9% female and 11.1% male. Race/ethnicity of participants included White (91.1%), Black (4.4%), and Asian (4.4%) with 4.4% Hispanic/Latino. Practice area responses were recoded from the original survey responses to family practice, specialty clinic, women's health/midwifery/OBGYN, behavioral health/psychiatry, and urgent/emergency care/trauma. Recoding was completed based upon the large number of responses listed in the "other" category.

Skewness indices revealed results of demographic data reflecting gender, race/ethnicity, Hispanic ancestry, and length of time as an APRN was highly skewed. Survey results on length of time as an APRN revealed most study participants had less than five years of experience. This violated the assumptions of a normal distribution and influenced data analysis methods (Polit, 2010).

Table 2

Demographic and Clinical Characteristics of the Sample Retained for Analysis.

Characteristic	Pre-best practice review (n=45)
Gender % (n)	
Male	11.1% (5)
Female	88.9% (40)
Age % (n)	
25 to 34	13.3% (6)
35 to 44	35.6% (16)
45 to 54	26.7% (12)
55 to 64	22.2% (10)
65 to 74	2.2% (1)
Mean years in practice (n)	8.2 years
Length of time utilizing CSPMP % (n)	
Less than 3 months	2.2% (1)
3-6 months	11.1% (5)
6-12 months	11.1% (5)
More than 1 year	75.6% (34)
Race/ethnicity % (n)	
White	91.1% (41)
Black	4.4% (2)
American/Alaskan Native	0.0% (0)
Asian	4.4% (2)
Native Hawaiian/Pacific Islander	0.0% (0)
Other	0.0% (0)
Hispanic or Latino % (n)	
Yes	4.4% (2)
No	95.6% (43)
Specialty % (n)	
Family practice	28.9% (13)
Specialty clinic	28.9% (13)
Women's health/ Midwifery/OBGYN	11.1% (5)
Behavioral health/psychiatry	11.1% (5)
Urgent/emergency care/trauma	20.0% (9)

Normative beliefs were analyzed by questions on professional and moral obligation with responses on a five-point Likert scale and were operationalized by asking what percentage of peers the respondent felt should and actually did check the CSPMP at least weekly (Table 3).

In the preliminary survey, 18.2% (n = 8) believed 91-100% of their colleagues utilized AZCSPMP weekly, while 71.1% (n = 32) thought 91-100% of their colleagues should utilize the AZCSPMP weekly. Interestingly, in the post-survey, the number of APRNs who believed 91-100% of their colleagues used the PMP weekly dropped to 4.5% (n = 1), while there was an

increase in the number (72.7%, n = 16) who believed 91-100% ought to use the PMP at least weekly.

Table 3

Quantitative Survey Data by Theoretical Framework Concept of Normative Beliefs

Question	Response	Preliminary (n = 45) % (n)	Post-Intervention (n = 22) % (n)
What percentage of your colleagues do you think uses the CSPMP at least weekly?	None	6.8% (3)	0.0% (0)
	1-10%	9.1% (4)	9.1% (2)
	11-20%	0.0% (0)	4.5% (1)
	21-30%	4.5% (2)	9.1% (2)
	31-40%	2.3% (1)	4.5% (1)
	41-50%	13.6% (6)	9.1% (2)
	51-60%	18.2% (8)	9.1% (2)
	61-70%	11.4% (5)	4.5% (1)
	71-80%	9.1% (4)	27.3% (6)
	81-90%	6.8% (3)	18.2% (4)
	91-100%	18.2% (8)	4.5% (1)
What percentage of your colleagues do you feel ought to be using the CSPMP at least weekly?	None	0.0% (0)	0.0% (0)
	1-10%	6.7% (3)	4.5% (1)
	11-20%	2.2% (1)	0.0% (0)
	21-30%	0.0% (0)	4.5% (1)
	31-40%	0.0% (0)	0.0% (0)
	41-50%	8.9% (4)	0.0% (0)
	51-60%	2.2% (1)	9.1% (2)
	61-70%	2.2% (1)	0.0% (0)
	71-80%	2.2% (1)	0.0% (0)
	81-90%	4.4% (2)	9.1% (2)
	91-100%	71.1% (32)	72.7% (16)
I have a professional responsibility to check the CSPMP when prescribing/ dispensing controlled substances.	Strongly disagree	0.0% (0)	0.0% (0)
	Disagree	0.0% (0)	0.0% (0)
	Neither disagree or agree	2.2% (1)	0.0% (0)
	Agree	20.0% (9)	22.7% (5)
	Strongly agree	77.8% (35)	77.3% (17)
Checking the CSPMP when prescribing/ dispensing controlled substances is the right thing to do.	Strongly disagree	0.0% (0)	0.0% (0)
	Disagree	0.0% (0)	0.0% (0)
	Neither disagree or agree	2.2% (1)	4.5% (1)
	Agree	17.8% (8)	13.6% (3)
	Strongly agree	80.0% (36)	81.8% (18)
Using the CSPMP when prescribing/ dispensing controlled substances is considered standard of care.	Strongly disagree	0.0% (0)	0.0% (0)
	Disagree	6.7% (3)	0.0% (0)
	Neither disagree or agree	2.2% (1)	9.1% (2)
	Agree	24.4% (11)	18.2% (4)
	Strongly agree	66.7% (3)	72.7% (16)
Prescribing/dispensing controlled substances without checking the CSPMP would be morally wrong.	Strongly disagree	2.2% (1)	0.0% (0)
	Disagree	24.4% (11)	4.5% (1)
	Neither disagree or agree	35.6% (16)	45.5% (10)
	Agree	22.2% (10)	22.7% (5)
	Strongly agree	15.6% (7)	27.3% (6)
Checking the CSPMP when prescribing/ dispensing controlled substances is not a necessary part of my job.	Strongly disagree	53.3% (24)	50.0% (11)
	Disagree	35.6% (16)	45.5% (10)
	Neither disagree or agree	6.7% (3)	0.0% (0)
	Agree	2.2% (1)	4.5% (1)
	Strongly agree	2.2% (1)	0.0% (0)

Regarding professional obligation, after the best practice review, an increased percentage of providers (72.7%, n =16 versus 66.7%, n =30) reported using the CSPMP when prescribing/ dispensing controlled substances is considered standard of care.

Moral obligation also appeared to improve post-intervention with 50.0% (n = 11) versus 37.8% (n = 17) reporting they agreed or strongly agreed prescribing/dispensing controlled substances without checking the CSPMP would be morally wrong.

Prescriber *attitude* regarding APRN concern of substance abuse statewide as well as within their respective practice community was evaluated utilizing a three-point Likert scale and is presented in Table 4. Providers reported increased concern about substance abuse statewide (n = 29, 64.4%,) versus in their practice community (n = 27, 60.0%) in the preliminary survey. However, in the post-intervention survey concern was equal for the state and local community (59.1%, n = 13).

Table 4

Quantitative Survey Data by Theoretical Framework Concept of Attitude

Question	Response	Preliminary (n = 45) % (n)	Post-Intervention (n = 22) % (n)
How concerned are you about prescription drug misuse and abuse among patients in Arizona?	Not at all	2.2% (1)	0.0% (0)
	A moderate amount	33.3% (15)	40.9% (9)
	A great deal	64.4% (29)	59.1% (13)
How concerned are you about prescription drug misuse and abuse among patients in the community where you practice?	Not at all	4.4% (2)	4.5% (1)
	A moderate amount	35.6% (16)	36.4% (8)
	A great deal	60.0% (27)	59.1% (13)

Outcome expectancies were garnered from survey questions on perceived PDMP utility (four-point Likert scale) and perceived PDMP barriers/control factors (five-point Likert scale). Provider perception of PDMP utility regarding building trust as well identifying patients who

obtain/fill multiple prescriptions and misuse controlled prescription medication were noteworthy. Understandably, 50.0% or fewer of providers reported the PDMP was very helpful for building trust both pre- and post-intervention. Alternatively, most providers reported great utility in identifying patients who fill multiple controlled substance prescriptions and/or misuse prescription medication (Table 5).

Table 5

Quantitative Survey Data by Theoretical Framework Concept of Outcome Expectancies: Utility

Question	Response	Preliminary(n = 45) % (n)	Post-Intervention(n = 22) % (n)
How useful to you is the Arizona Controlled Substances Prescription Monitoring Program (CSPMP) for helping manage patients with pain?	Not at all useful	0.0% (0)	0.0% (0)
	Not so useful	4.4% (2)	4.5% (1)
	Somewhat useful	15.6% (7)	13.6% (3)
	Very useful	80.0% (36)	81.8% (18)
How useful to you is the CSPMP for helping build trust with patients?	Not at all useful	0.0% (0)	0.0% (0)
	Not so useful	13.3% (6)	9.1% (2)
	Somewhat useful	37.8% (17)	40.9% (9)
	Very useful	48.9% (22)	50.0% (11)
How useful to you is the CSPMP for informing decisions to prescribe/dispense controlled substances?	Not at all useful	2.2% (1)	0.0% (0)
	Not so useful	2.2% (1)	0.0% (0)
	Somewhat useful	17.8% (8)	22.7% (5)
	Very useful	77.8% (35)	77.3% (17)
How useful to you is the CSPMP for identifying patients filling prescriptions from multiple doctors and/or pharmacies?	Not at all useful	0.0% (0)	0.0% (0)
	Not so useful	0.0% (0)	0.0% (0)
	Somewhat useful	6.7% (3)	13.6% (3)
	Very useful	93.3% (42)	86.4% (19)
How useful to you is the CSPMP for identifying patients who misuse or abuse controlled prescription drugs?	Not at all useful	0.0% (0)	0.0% (0)
	Not so useful	2.2% (1)	0.0% (0)
	Somewhat useful	26.7% (12)	22.7% (5)
	Very useful	71.1% (32)	77.3% (17)

Barriers and control factors representing additional theoretical framework concepts of outcome expectancies are presented in Table 6. Factors specific to perceived barriers and control included reviewing perceived PDMP utility, relevance, access, and ease of use. After best practice review, 77.3% (n = 17) strongly agreed the AZCSPMP is helpful and 44.5% (n = 10)

reported it was easy to use in contrast to pre-intervention of 66.7% (n = 30) and 42.2% (n = 19), respectively.

Table 6

Quantitative Survey Data by Theoretical Framework Concept of Outcome Expectances: Barriers/Control Factors

Question	Response	Preliminary(n = 45) % (n)	Post-Intervention (n = 22) % (n)
The CSPMP is helpful.	Strongly disagree	2.2% (1)	0.0% (0)
	Disagree	0.0% (0)	0.0% (0)
	Neither disagree or agree	2.2% (1)	4.5% (1)
	Agree	28.9% (13)	18.2% (4)
	Strongly agree	66.7% (30)	77.3% (17)
The CSPMP is not relevant to my practice.	Strongly disagree	57.8% (26)	50.0% (11)
	Disagree	24.4% (11)	40.9% (9)
	Neither disagree or agree	6.7% (3)	0.0% (0)
	Agree	8.9% (4)	0.0% (0)
	Strongly agree	2.2% (1)	9.1% (2)
The CSPMP is easy to use.	Strongly disagree	0.0% (0)	0.0% (0)
	Disagree	6.7% (3)	4.5% (1)
	Neither disagree or agree	11.1% (5)	4.5% (1)
	Agree	40.0% (18)	45.5% (10)
	Strongly agree	42.2% (19)	45.5% (10)
I don't know how to use the CSPMP.	Strongly disagree	62.2% (28)	68.2% (15)
	Disagree	28.9% (13)	27.3% (6)
	Neither disagree or agree	4.4% (2)	0.0% (0)
	Agree	4.4% (2)	4.5% (1)
	Strongly agree	0.0% (0)	0.0% (0)
I have limited or no access to the CSPMP while I practice.	Strongly disagree	62.2% (28)	63.6% (14)
	Disagree	28.9% (13)	27.3% (6)
	Neither disagree or agree	6.7% (3)	4.5% (1)
	Agree	2.2% (1)	4.5% (1)
	Strongly agree	0.0% (0)	0.0% (0)
The CSPMP is checked by someone else in the office.	Never	44.4% (20)	45.5% (10)
	Rarely	22.2% (10)	13.6% (3)
	Sometimes	17.8% (8)	18.2% (4)
	Usually	11.1% (5)	13.6% (3)
	Always	4.4% (2)	9.1% (2)

Behavior intention appeared to increase post-QI intervention. APRNs reporting being likely or extremely likely to utilize the CSPMP in the next 3 months improved from 91.2% in the preliminary survey to 95.5% post-intervention (Table 7).

Table 7

Quantitative Survey Data by Theoretical Framework Concept of Behavior Intention

Question	Response	Preliminary(n = 45) % (n)	Post-Intervention(n = 22) % (n)
How likely are you to use the CSPMP at least once in the next three months?	Extremely unlikely	6.7% (3)	0.0% (0)
	Unlikely	2.2% (1)	4.5% (1)
	Likely	15.6% (7)	18.2% (4)
	Extremely likely	75.6% (34)	77.3% (17)

Findings did not support a relationship between practice area and best practice adherence (Table 8). Study outcomes were not consistent with literature review findings of increased utilization in long-term prescribers. Long-term prescribers were represented by the family practice category in this sample.

Table 8

Correlation between Practice Area and Best Practice Behaviors

		Check 12-month CSPMP prior to opioid rx.	Review MMEs prior to opioid rx.	Check CSPMP every 3 months	Document concerning PDMP results	Maintain opioid dosage <50 MMEs per day
Practice area	Correlation Coefficient	-.075	-.180	-.137	.027	.085
	Sig. (2-tailed)	.622	.238	.370	.860	.579
	N	45	45	45	45	45

Table 9

Correlation between Reported CSPMP Ease of Use and Best Practice Behaviors

		Check 12-month CSPMP prior to opioid rx.	Review MMEs prior to opioid rx.	Check CSPMP every 3 months	Document concerning PDMP results	Maintain opioid dosage <50 MMEs per day
CSPMP is easy to use	Correlation Coefficient	.376*	.245	.414**	.071	.064
	Sig. (2-tailed)	.011	.105	.005	.645	.674
	N	45	45	45	45	45
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

Consistent with prior studies, a relationship between reported ease of use and PDMP utilization was suggested (Table 9). Ease of CSPMP use was positively correlated with checking the CSPMP prior to prescribing opioids for chronic, non-cancer, non-terminal pain ($r_s = .376$, $p < .05$) and checking the CSPMP every three months during opioid treatment ($r_s = .414$, $p < .001$).

An additional question was added to the post-intervention survey reflecting literature review findings that suggested prescribers limit checking the PDMP based upon subjective interpretation. Responses to this question supported prior findings that subjective interpretation plays a large role in whether they will request an AZCSPMP report. Fourteen out of twenty-two (63.7%) respondents affirmed utilizing this method of decision making when deciding if substance misuse was of concern.

Accordingly, no significant relationship was found between best practice behaviors and checking CSPMP by subjective impression. This suggests prescribers who relied on subjective impression have not followed best practice recommendations (Table 10).

Table 10

Correlation between Checking CSPMP by Subjective Impression and Best Practice Behaviors

		Check 12-month CSPMP prior to opioid rx.	Review MMEs prior to opioid rx.	Check CSPMP every 3 months	Document concerning PDMP results	Maintain opioid dosage <50 MMEs per day	Check 12-month CSPMP prior to opioid rx.
Check CSPMP by subjective impression	Correlation Coefficient	1.000	-.054	.091	.001	-.179	.347
	Sig. (2-tailed)	.	.811	.686	.998	.425	.114
	N	22	22	22	22	22	22

Discussion

This DNP project utilized QI through best practice review for prescribing opioids in patients with chronic non-cancer, non-terminal pain. Best practices included initial PDMP review prior to prescribing opioid medication for non-cancer, non-terminal pain, reviewing morphine milligram equivalents (MMEs) of prior prescriptions, <3- month PDMP review for

patients receiving chronic opioid medication, APRN addressing concerning PDMP review results, and maintaining an opioid dosage < 50 MMEs. Findings suggest increased APRN adherence to opioid prescribing best practices after online QI review. The target for the outcome indicators of 30 percent compliance for all set at baseline and 60 percent at one month post initial survey/QI activity was met for one indicator, but was not met for four indicators. Findings from this project supported previous outcomes that self-reported ease of access improved PDMP utilization initial 12-month PDMP review prior to prescribing opioid medication and <3- month PDMP review for patients receiving chronic opioid medication. However, results did not support previous data suggesting practice area was associated with PDMP utilization.

Theoretical framework concepts evaluated in this project included normative beliefs, attitude, outcome expectancies, barriers and control factors, and behavior intention. Findings suggest a change in normative beliefs specifically improved adherence to best practice recommendations as well as an increased percentage of respondents believing peers ought to be checking the PDMP. This supports theoretical framework concepts of professional and moral obligation as well. It is possible best practice review signified a new normative behavior, contributing to improved adherence.

An unexpected finding was the dramatic increase in PDMP registration rates. Information available from 2017 revealed only 22% prescribers were registered with the AZCSPMP (Dodge, 2017). The sample in this project reported 100% compliance with the state mandate for AZCSPMP registration. This is certainly an encouraging finding and suggests the mandate is aiding APRN compliance with best practice recommendations.

Cost-Benefit Analysis/Budget

It is estimated that the DNP project director provided 760 donated hours including preparatory work, survey development, data analysis, documentation, results review, and presentation. Cost of mailings, follow-up contact, office supplies, and software packages/online tools were the greatest monetary expense and were an in-kind donation. APRN participation time completing the pre-/ post-surveys and the QI activity was estimated at 25 minutes. Non-monetary benefits included improved patient care via best practice behaviors with the goal of reduced morbidity and mortality. See Appendix H for cost/benefit analysis/budget.

Strengths

A number of strengths and successes were associated with the DNP project. Potential facilitators for the project included the national opioid crisis and its associated publicity, as well as Arizona's well-developed PMDP. This project focused exclusively on APRN practice. It highlighted APRN practice modification in accordance with best practice recommendations. Results revealed improvement in AZCSPMP utilization across all best practice behaviors. An unexpected finding was the markedly increased compliance with the Arizona mandate of PDMP registration was reported by 100% of respondents. Outcomes supported previous findings that providers utilize subjective impression as the indicator for CSPMP review and were significantly correlated with best practice behaviors. Lastly, the data collected contained a number of factors related to PDMP utilization and barriers and is amenable to further analyses.

Limitations

Despite the noted successes and strengths of the project, there were some limitations, including those related to project design. Response rate was low, limiting generalizability of findings. The low response rate was not entirely surprising based upon the original means of contact by U.S. Postal Service. The goal sample size of 161 was not met, thus the standard

confidence interval of .80 and a margin of error of 0.05 was not achieved. A repeated measures design could be utilized in the future to test for significant differences pre- and post-intervention. Study findings and limitations lay the groundwork for future QI initiatives. Future projects can build upon this project's findings and limitations.

Dissemination

The DNP student presented outcomes and recommendations to several stakeholders. This included the clinical site, the Arizona Board of Nursing, and Dr. John A. Pugliese, the original survey developer. The DNP student submitted the doctoral Capstone project to Scholarworks for publication. The DNP student may also pursue additional dissemination opportunities by presenting at applicable conferences and/or submitting the project summary to appropriate journals for publication. This best practice review can direct future QI efforts. Follow-up QI initiatives/projects with APRNs in Arizona as well as other states could be conducted to assess change over time. Post-project continuation will help ensure sustainability of change.

Conclusion

Best practices when prescribing opioids for chronic, non-cancer, non-terminal pain is critical for patient safety and positive outcomes. Opioid overdoses and opioid deaths are preventable. Targeted interventions are necessary to minimize the morbidity and mortality of this epidemic. The national publicity of the opioid crisis provides an opportunity to improve health care. This Capstone project utilized best practices for risk mitigation. Evaluating opioid prescribing practices and PDMP utilization from a QI perspective opens the door for systematic change, which can improve the utility of PDMPs and ultimately improve patient safety and quality of life.

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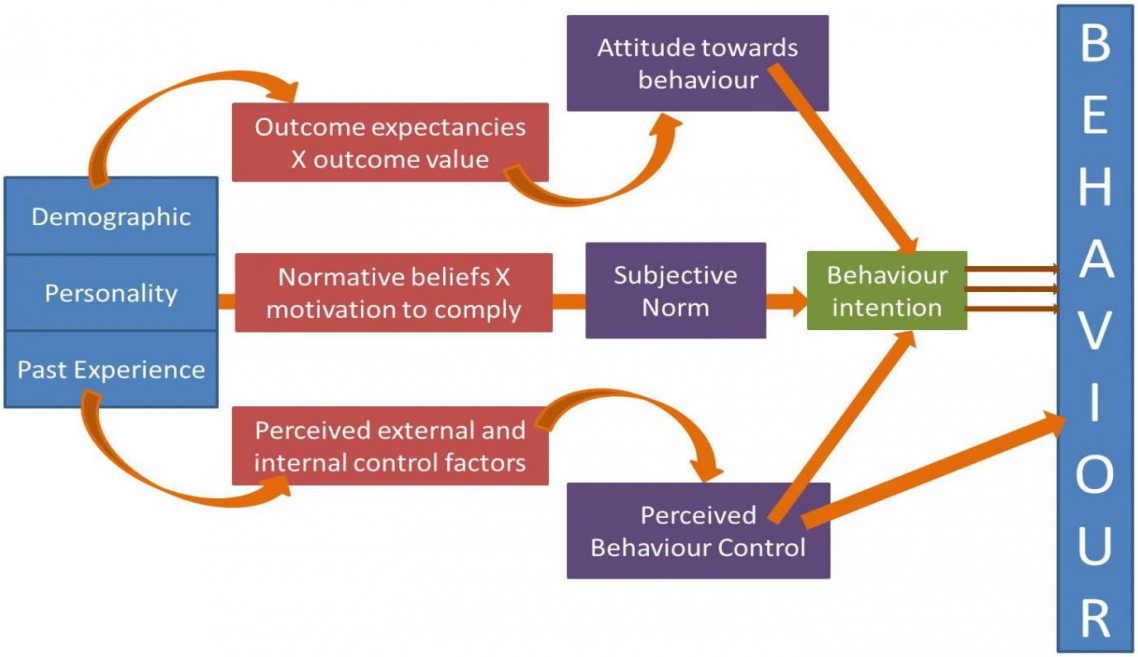
Appendix A

Theoretical Framework

Fishbein and Ajzen's (2010)

Theory of Reasoned Action and Planned Behavior



Appendix B

Board of Nursing Approval of Requested List for QI Project

Brenda Vigue

Subject: FW: Contact Form Submission From Brenda Vigue - Education

From: Kathleen Malloch [mailto:kmalloch@azbn.gov]
Sent: Thursday, October 11, 2018 9:11 PM
To: jaeleigh13@gmail.com
Subject: Re: Contact Form Submission From Brenda Vigue - Education

Hi Brenda, of course. You are approved to use the AZ Broad of Nursing List for your Quality Improvement DNP project.

Kathy

Kathy Malloch, PhD, MBA, RN, FAAN

Associate Director/Education & Evidence Based Regulation

Arizona State Board of Nursing

602 771 7803 Office

602 617 1261 Cell

On December 18th, 2017 we moved! Our new address is:

1740 W. Adams Street

Phoenix, AZ 85007

> On Wed, Oct 10, 2018 at 8:01 AM Lyn Ledbetter <lledbetter@azbn.gov> wrote:
>
> Thank you for your message. I am sending this to my supervisor for her review.
>
> Kathy, this is regarding the phone call I was telling you about last week

Appendix B (continued)

Board of Nursing Approval of Requested List for QI Project

Lyn Ledbetter
Administrative Assistant
Education Department
Email: lledbetter@azbn.gov
Our new address is:
1740 W. Adams St.
Phoenix, AZ 85007

On Tue, Oct 9, 2018 at 8:00 PM <do-not-reply@azbn.gov> wrote:

Date Received:	10/9/2018 8:00:05 PM
IP Address:	2604:2d80:cc11:828e:3508:560b:591a:7fb0
Full Name:	Brenda Vigue
Email Address:	jaeleigh13@gmail.com
Phone Number:	6236959923
Preferred Contact Method:	Email
Inquiry Reason:	Education
Message:	Hello, I am in a DNP program with the University of Massachusetts Amherst. For my Capstone quality improvement project, I requested and received a mailing list of active Arizona APRNs. The IRB at my university is requesting I obtain correspondence from the Board that the list has been provided to me for the stated QI project. The email I received with the list did not specify this. Would it be possible to obtain this so I can forward it to the university IRB per their request? Thank you for your help, Brenda Vigue, APRN, MS, FNP-BC, PMHNP-BC

Appendix C

Invitation to Participate in Project

To my Capstone Project!

I am enrolled in the onDine DNP program at the University of Massachusetts – Amherst.

I am conducting an analysis related to opioid prescribing in Arizona & would be most grateful if you would be willing to participate.

For more information, please contact me at bvigue@umass.edu or go to www.surveymonkey.com . . .

Best Regards,
Brenda Vigue, APRN, MS, FNP-BC, PMHNP-BC

Appendix D

Letter Requesting Permission to Use Survey

July 19, 2018

John A. Pugliese, PhD
1616 Capitol Avenue
Suite 74.436, Building 174
Sacramento, CA 95814

Dear Dr Pugliese:

I am a doctoral student enrolled in the Doctorate in Nursing (DNP) program at the University of Massachusetts Amherst, under the direction of Dr. Terrie Black, DNP Project Chair. Dr. Black can be reached at tblack@umass.edu. My DNP Capstone Project is entitled, *Mitigating Prescription Opioid Risk: Prescription Drug Monitoring Programs*,

I would like your permission to use the Opioid Prescribing by Medical Toxicologists survey in my doctoral project. I would like to use and print your survey under the following conditions:

- I will use the surveys only for my DNP scholarly project and will not sell or use it with any compensated or curriculum development activities.
- I will include the copyright statement on all copies of the instrument.
- I will send a copy of my completed DNP scholarly project to your attention upon completion of the study.

If these are acceptable terms and conditions and/or there are any other considerations you would like, please contact me by email at bvigue@umass.edu. Thank you.

Sincerely,

Brenda Vigue, APRN, MS, FNP-BC, PMHNP-BC
College of Nursing
University of Massachusetts Amherst
Skinner Hall
651 North Pleasant Street
Amherst, MA 01003-9299

Appendix E

Email Granting Permission to Use Survey

Subject **Opioid Prescribing Survey**
From <John.Pugliese@cdph.ca.gov>
To bvigue@umass.edu <bvigue@umass.edu>
Cc tblack@umass.edu <tblack@umass.edu>
Date 2018-08-09 16:36

Brenda,

Thank you for the thoughtful letter requesting permission to use our survey. The survey you reference "Opioid Prescribing by Medical Toxicologists" does not sound like the survey my colleagues and I published recently. However, we did publish prescribing, dispensing, and PDMP survey items in our most recent article focusing on physicians and pharmacists. You are free to use the items. Please cite us as appropriate, and yes, I would very much like to read the completed project manuscript.

You can find the items in the following article: https://www.ncbi.nlm.nih.gov/pubmed/29559202

Thank you for the interest in our work. Best of luck with your DNP capstone project.

Best,

John

John Pugliese, Ph.D.

California Department of Public Health

Phone: 916.449.5381

Email: john.pugliese@cdph.ca.gov

Appendix F

Preliminary Survey

I. *Do you have prescribing privileges in the state of Arizona? Yes, No—Inclusion question*

II. *Do you possess an active DEA certificate for the state of Arizona? Yes, No—Inclusion question*

III. *Concerned about misuse of control substances: not concerned at all (0) to a great deal (2).*

a. How concerned are you about prescription drug misuse and abuse among patients in Arizona?

b. How concerned are you about prescription drug misuse and abuse among patients in the community where you practice?

IV. *Usefulness of the PDMP: not useful at all (0) to very useful (3).*

a. How useful to you is the Arizona Controlled Substances Prescription Monitoring Program (CSPMP) for helping manage patients with pain?

b. How useful to you is the CSPMP for helping build trust with patients?

c. How useful to you is the CSPMP for informing decisions to prescribe/dispense controlled substances?

d. How useful to you is the CSPMP for identifying patients filling prescriptions from multiple doctors and/or pharmacies?

e. How useful to you is the CSPMP for identifying patients who misuse or abuse controlled prescription drugs?

V. *PDMP normative believes: 11-point scale, 0% to 100%*

a. What percentage of your colleagues do you think uses the CSPMP at least weekly?

b. What percentage of your colleagues do you feel ought to be using the CSPMP at least weekly?

VI. *Professional and moral obligation: Strongly disagree (1) to strongly agree (5)*

a. I have a professional responsibility to check the CSPMP when prescribing/dispensing controlled substances.

b. Checking the CSPMP when prescribing/dispensing controlled substances is the right thing to do.

c. Using the CSPMP when prescribing/dispensing controlled substances is considered standard of care.

d. Prescribing/dispensing controlled substances without checking the CSPMP would be morally wrong.

e. Checking the CSPMP when prescribing/dispensing controlled substances is not a necessary part of my job.

VII. *Barriers to use: Strongly disagree (1) to strongly agree (5).*

a. The CSPMP is helpful.

b. The CSPMP is not relevant to my practice.

c. The CSPMP is easy to use.

d. I don’t know how to use the CSPMP.

Appendix F (continued)

Survey

a. I have limited or no access to the CSPMP while I practice.

b. The CSPMP is checked by someone else in the office. *Never (0) to always (4).*

VIII. How long have you been using the CSPMP?: *Less than three months (1) to more than one year (4).*

IX. How likely are you to use the CSPMP at least once in the next three months? *Extremely unlikely (1) to extremely likely (4).*

X. *Gender (M, F)*

XI. *Age (7 categories)*

XII. *Years in practice (In years)*

XIII. *Race/ethnicity*

a. White
b. Black
c. American/Alaskan Native
d. Asian
e. Native Hawaiian/Pacific Islander
f. Other

XIV. *Hispanic or Latino (Yes, No)*

XV. *Specialty*

a. Family practice
b. Specialty clinic
c. Women's health
d. Behavioral health/psychiatry
e. Midwifery/OBGYN
f. Pediatrics
g. Other

XVI. *Normative beliefs/best practice (Not from original survey): Less than once/month (1) to every day (6)*

a. I check an initial 12-month PDMP report prior to prescribing opioids for patients with chronic non-cancer, non-terminal pain.
b. I review the MME of prior prescriptions.

XVII. *Normative beliefs/best practices—(Not from original survey): Never (1) to always (5)*

c. I check the CSPMP every three months or sooner for patients receiving opiates for chronic non-cancer, non-terminal pain.
d. I document concerning PDMP review results.
e. I maintain an opioid dosage < 50 morphine milligram equivalents (MMEs) per day.

Note. Reprinted from Pugliese, J. A., Wintemute, G. J., & Henry, G. S. (2018). Psychosocial correlates of clinicians' prescription drug monitoring utilization. *American Journal of Preventative Medicine, 31,* 556. doi: 10.1016/j.amepre.2018.02.009.

Appendix G

Post-intervention Survey

I. *Concerned about misuse of control substances: not concerned at all (0) to a great deal (2).*
   a. How concerned are you about prescription drug misuse and abuse among patients in Arizona?
   b. How concerned are you about prescription drug misuse and abuse among patients in the community where you practice?

II. *Usefulness of the PDMP: not useful at all (0) to very useful (3).*
   a. How useful to you is the Arizona Controlled Substances Prescription Monitoring Program (CSPMP) for helping manage patients with pain?
   b. How useful to you is the CSPMP for helping build trust with patients?
   c. How useful to you is the CSPMP for informing decisions to prescribe/dispense controlled substances?
   d. How useful to you is the CSPMP for identifying patients filling prescriptions from multiple doctors and/or pharmacies?
   e. How useful to you is the CSPMP for identifying patients who misuse or abuse controlled prescription drugs?

III. *PDMP normative believes: 11-point scale, 0% to 100%*
   a. What percentage of your colleagues do you think uses the CSPMP at least weekly?
   b. What percentage of your colleagues do you feel ought to be using the CSPMP at least weekly?

IV. *Professional and moral obligation: Strongly disagree (1) to strongly agree (5)*
   a. I have a professional responsibility to check the CSPMP when prescribing/dispensing controlled substances.
   b. Checking the CSPMP when prescribing/dispensing controlled substances is the right thing to do.
   c. Using the CSPMP when prescribing/dispensing controlled substances is considered standard of care.
   d. Prescribing/dispensing controlled substances without checking the CSPMP would be morally wrong.
   e. Checking the CSPMP when prescribing/dispensing controlled substances is not a necessary part of my job.

V. *Barriers to use: Strongly disagree (1) to strongly agree (5).*
   a. The CSPMP is helpful.
   b. The CSPMP is not relevant to my practice.
   c. The CSPMP is easy to use.
   d. I don’t know how to use the CSPMP.
   c. I have limited or no access to the CSPMP while I practice.
   d. The CSPMP is checked by someone else in the office. *Never (0) to always (4).*

Appendix G (continued)

Post-intervention Survey

VI. How long have you been using the CSPMP?: *Less than three months (1) to more than one year (4).*

VII. How likely are you to use the CSPMP at least once in the next three months? *Extremely unlikely (1) to extremely likely (4).*

VIII. *Subjective impression—(Not from original survey): Never (1) to always (5)*

a. I check a PDMP report only when I am concerned a patient is misusing their opioid medication.

IX. *Normative beliefs/best practice (Not from original survey): Less than once/month (1) to every day (6)*

f. I check an initial 12-month PDMP report prior to prescribing opioids for patients with chronic non-cancer, non-terminal pain.

g. I review the MME of prior prescriptions.

X. *Normative beliefs/best practices—(Not from original survey): Never (1) to always (5)*

h. I check the CSPMP every three months or sooner for patients receiving opiates for chronic non-cancer, non-terminal pain.

i. I document concerning PDMP review results.

j. I maintain an opioid dosage < 50 morphine milligram equivalents (MMEs) per day.

Note. Reprinted from Pugliese, J. A., Wintemute, G. J., & Henry, G. S. (2018). Psychosocial correlates of clinicians' prescription drug monitoring utilization. *American Journal of Preventative Medicine, 31,* 556. doi: 10.1016/j.amepre.2018.02.009.

Appendix H

Cost/benefit Analysis

		Cost	Benefit
Monetary	Survey Monkey access	$224.00	
	Office supplies Toner cartridges Paper Misc.	 $241.95 $67.34 $41.07	
	Professional editing	$484.00	
	Arizona Board of Nursing – APRN mailing list	$100.00	
	Postcards	$150.00	
	Mailing labels	$40.00	
	Postage	$595.00	
	SPSS statistical software	$99.00	
	MONETARY TOTAL	**$2,042.36**	
Non-monetary	APRNs	25 minutes	Improved pt. care
	Project director – time	760 hours	Improved pt. care
	Patients		Reduced morbidity & mortality